Forest &Tree Health in Iowa 1994

Why worry about the health of our forests?

Although only 6% of Iowa is covered by forests, approximately 2 million acres, these natural resources have significant impact on our state. Wood industries employ over 7,000 Iowans producing lumber and high quality wood products. Our forests are a critical component for wildlife habitat, soil conservation, water quality, outdoor recreation and aesthetic pleasure. Trees in our communities increase property values and conserve energy. For many Iowans, "living in Iowa without our forest and trees, would make our *Field of Dreams* a dust bowl."

Because our forest resources are valuable to the citizens of Iowa, the Forestry Division of the Iowa Department of Natural Resources (DNR) began monitoring forest and tree health conditions in the late 1970's. It continues today to determine overall forest and tree health conditions, status of natural and exotic insect and disease problems, and to provide up to date information for private and public managers to aid in the sustained management of Iowa's forest resources.

Cooperative efforts with Iowa State University, the Iowa Department of Agriculture and Land Stewardship, the USDA Forest Service, municipal foresters and private forest land owners allows efficient monitoring efforts. In addition, cooperation fosters improved communications to the professional and general public on Iowa's forest resource management issues.

Monitoring Efforts for 1994

Estimates of serious forest and tree health problems, such as insects, diseases, and flooding impacts were determined by aerial surveys of over 222,000 acres of representative forest areas across the state conducted over the Summer of 1994. In addition, visual surveys from DNR Foresters, municipal foresters, Christmas tree growers, trained volunteers and results from the Plant Disease Clinic at Iowa State University assist in determining forest and tree health conditions and distribution. The potentially greatest threat to our forests from the famous "Gypsy Moth" required placement of 5,797 traps by the State Entomologists Office to determine infestation areas and sites in need of quick eradication efforts.

Recent efforts to develop vegetation management plans for selected state park areas utilizing Geographic Information System (GIS) mapping was begun in 1994 utilizing DNR Forestry aerial survey work. State park areas where this information is being utilized include: Backbone State Park, Stone State Park, Green Valley State Park, Springbrook Recreation Area, Wildcat Den State Park and Lake Darling State Park.

To determine the areas impacted by the Floods of 1993 on Iowa's forests, aerial flights of the wooded areas along major Iowa rivers were conducted. This included wooded areas along the Mississippi, Missouri, Des Moines, Cedar, Iowa and Nishnabotna Rivers. Ground surveys were conducted by DNR foresters to confirm specific tree species response in public areas in Charles City, Cherokee, Council Bluffs, Davenport, Des Moines, Fort Madison, Iowa City, Muscatine, Spencer, Waterloo and Webster City.

Intensive sampling was conducted in cooperation with Iowa State University Department of Plant Pathology in six Iowa communities to determine the impact of a

potentially serious Green/White Ash decline in community settings, "Ash Yellows". Municipal foresters participating included: Burlington, Davenport, Des Moines, Fort Dodge, Iowa City and Waterloo. Results and follow up work are expected in 1995.

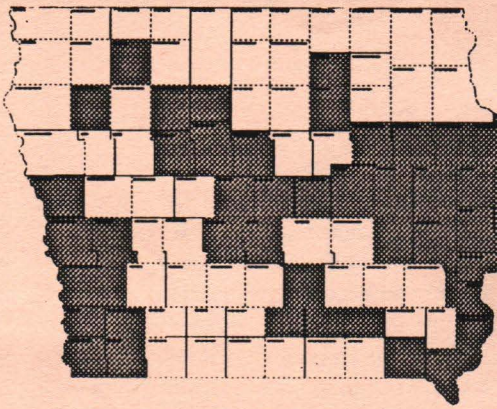
Plans for 1995, include aerial surveys of flood impacted sites and large tracts of forests.

Forest Results

Extensive flooding problems in 1993 were recorded in all 99 Iowa counties and had significant impact on over 97,500 acres of forest. In 1994, approximately 11,000 acres of forest throughout the state suffered complete tree mortality due to the 1993 long-term (greater than 2 consecutive weeks) flooding. Sites where tree mortality was greatest included areas behind major flood control reservoirs, such as Saylorville, Red Rock and Coralville dams. In addition, areas where major waterways met and flood waters backed up or stagnated showed high tree mortality. This included many state park and wildlife areas, for example, flood waters were over 30 feet deep for up to 3 months in Ledges State Park along the Des Moines River. Tree species most impacted by the floods of 1993 include: hackberry (*Celtis occidentalis*), black walnut (*Juglans nigra*), cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*) and many non native landscape ornamental and coniferous species.

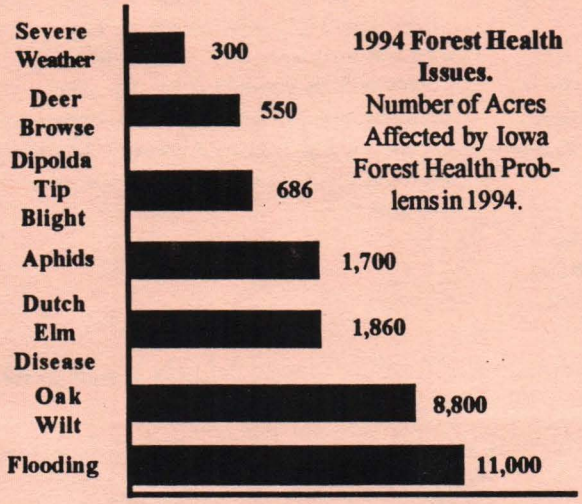
Oak Wilt, caused by the fungus *Ceratocystis fagacearum* invades the water conducting tissues (xylem) of oak trees and causes the foliage to wilt and die. This continues to be the most serious tree disease in Iowa, although acreage infected decreased from 10,440 acres in 1993 to 8,800 acres during 1994. Although all species of oaks are susceptible, the red oak group,

Flooding Tree Mortality 199



especially black oak (*Quercus velutina*) and red oak (*Quercus rubra*) often die within weeks of infection. Oak wilt is spread via root grafts and sap-feeding bark beetles. Although there is no cure for Oak Wilt, control strategies such as preventing tree wounds during high infection periods (April 1 to July 1), disease containment, and removing infected trees promptly appear to be the most effective management options.

Dutch elm disease (DED) caused by the fungus *Ophiostoma ulmi/novo-ulmi*, has re-established itself with a new aggressive strain across Iowa during 1994, infecting an additional 1,860 acres of American elm (*Ulmus americana)*, red elm (*Ulmus rubra)*, and even Siberian elm (*Ulmus pumila)*. Much of the re-emergence of DED is due to the high humidity conditions of the past few years, and an increase in the number of 20-30 year old American elms that have naturally regenerated in bottomland areas across the state. Lack of sanitation and removal of infected trees has contributed to the increase by providing breeding sites for fungus carrying bark beetles infecting neighboring elms. The new strain of DED appears to cause faster tree mortality and is more aggressive infecting red elm and Siberian elm. DED will continue to be a problem in Iowa until sanitation efforts of infected trees improves.



1994 Forest Health Issues. Number of Acres Affected by Iowa Forest Health Problems in 1994.

Aphids (*Periphyllus spp.*) caused noticeable foliage discoloration of native stands of sugar maple (*Acer saccharium)* and basswood (*Tilia americana)* in Northeastern Iowa, impacting approximately 1,700 acres. Much of this appears to be due to plant stress caused by the saturated soils of 1993. Dipolda tip blight (*Sphaeropsis sapinea*) combined with Dothistroma needle blight (*Mycosphaerella pini)* damage to non native conifer plantations, windbreaks and ornamental plantings of Austrian pine (*Pinus nigra*), Red Pine (*Pinus resinosa),* Ponderosa pine (*Pinus ponderosa)* and Scotch Pine (*Pinus sylvestris)* increased significantly to 686 acres in 1994. Sources of the fungus increased due to the humid conditions of the 1992-93 and is forcing stand conversions from conifer plantations to native hardwoods on several state forest areas.

Browsing damage by White-tailed deer (*Odocoileus virginianus)* continued to cause extensive damage to forest and Christmas tree plantations and natural regeneration across the state. In 1994, approximately, 550 acres of forest received severe browse damage, and increasing amounts of damage to horticultural crops is occurring in the urban/rural interface zones. Severe weather in the form of tornadoes, hard frosts, hail and ice storms caused extensive stem breakage in Northeast and Southern Iowa during 1994. Soft wooded species such as silver maple, Siberian elm and high valued black walnut suffered damage of approximately 300 acres. Finally, agricultural herbicide drift appeared to be more severe in Eastern sections of the state in 1994, impacting over 100 acres.

Community Tree Results

The typical Iowa community is dominated by three major tree species: green ash (*Fraxinus pennsylvanica)*, silver maple and Norway maple (*Acer platanoides)*. These trees are subject to tremendous environmental stresses caused by severely compacted soils, herbicide injury and mower damage. These stresses often cause opportunistic secondary insect and diseases the chance to become established and cause gradual tree dieback and mortality. The impact of the floods of 1993 were not only felt by trees near waterways, but also by trees growing in poorly drained clay soils common in Iowa, due to saturated conditions. These saturated conditions caused additional tree losses in 74 Iowa communities involving non native little leaf lindens (*Tilia cordata*), Norway maple and several conifers species. Increasing secondary insects and disease problems such as Verticillium wilt (*Verticillium alboatrum)* on Norway maple and linden, Dipolda tip blight on Austrian pine, Cytospora canker (*Cytospora spp.)* on spruce, Anthracnose (*Gloeosporium gridum)* on ash and sycamore, Aphids on ash and maples, and Ash Plant bug (*Tropidosteptes amoenus)* on green ash

were reported in communities across the state.

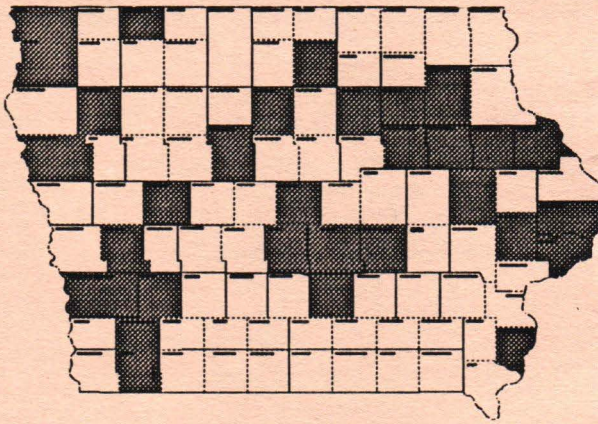
Dutch elm disease in several species of elms was also a major cause of tree mortality in Iowa communities, claiming over 5,100 trees in 1994. Again the occurrence of the new aggressive strain of DED, lack of sanitation and removal of infested trees is allowing significant tree loss, claiming state big tree champion American elm, red elm and Siberian elms.

Severe weather in the form of a tornado and large hail caused extensive stem breakage in the Cities of Decorah and LeMars and the City of Dubuque respectfully in early September of 1994. A widespread ice storm occurred on December 6 and 7, 1994 causing major stem-breakage of approximately 6,500 trees in the Southern Iowa communities of Ottumwa, Centerville, Fairfield, Muscatine and Washington. The potential of invasion by secondary organisms due to stem breakage will probably increase over the next several years.

Gypsy Moth in Iowa

The Gypsy Moth (*Lymantria dispar)* is a potentially serious insect defoliator of Iowa's native deciduous trees and forests. In 1994, the State Entomologist Office successfully treated one 90 acre infestation site in Polk County with aerial and ground treatments of Bacillus thuringiensis (Bt). Adult male moth trapping across the state yielded 143 moths and increase of over 50% from 1993. This increase in trapping results and alerts from other states confirmed that several shipments of infested Michigan nursery stock of blue spruce (*Picea pungens)* and White pine (*Pinus strobus)* entered the state and were distributed unknowingly by large discount retail merchants. This major violation of federally mandated quarantine of Gypsy moth infested nursery shipment may cause the occurrence of between 50 to 100 infestation sites in Iowa over the next few years. Major trapping efforts will be conducted by the State Entomologist Office and other cooperators during 1995 to delimit infestation sites for potential eradication efforts in 1996 and beyond.

1994 Gypsy Moth Captures



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